REMARKS

Summary of Office Action

Claims 1-118 were pending. Of these, claims 1-34 were withdrawn from consideration as drawn to a non-elected invention. Claims 62 and 63 have been rejected under 35 U.S.C. § 112 as being indefinite.

Claims 35-91 have been rejected under either 35 U.S.C. § 102(b) or § 102 (e) as being anticipated by any one of: Leblanc et al. International patent publication WO 98/10538 ("LeBlanc"); Li et al. "Comparison of indoor Geolocation Methods in DSS and OFDM Wireless LAN"("Li"); Hawkes et al. U.S. Patent No. 6,201,499 ("Hawkes"); Fattouche et al. U.S. Patent No. 6,201,499 ("Fattouche"); and Nakagawa et al. U.S. Patent No. ("Nakagawa").

Claims 92-118 have been rejected under 35 U.S.C. 103(a) as being obvious form any of Leblanc, Hawkes, Fattouche and Nakagawa in view of Li.

Applicants' Reply

Applicants have amended claim 62 to provide proper antecedent basis for the terms used therein. Applicants' submit that claim 62 and 63 now conform to all requirements of § 112.

Applicants respectfully traverse the prior art rejections of claims 35-118.

Independent claims 35, 62, 84, 92, 106 and 111

Applicants' invention relates to methods for identifying location using TOA data. Applicants' invention, according to claim 35, provides a time-of-arrival (TOA) estimate of a data signal at a receiver by (1) demodulating the receiver signal, (2) decoding the received signal to recover a time-stamp, and (3) using a co-relation function to estimate a

TOA when the decoded signal does not include a time stamp. The method according to claim 62 provides estimates of a data signal TOA (like that in claim 35) at two receivers, and calculates a TOA difference (TDOA) between the two receivers from which the location of an asset can be determined. The method according to claim 84 requires that the claim 35 TOA determinations be conducted at least three receivers, and uses at least two TDOAs for determining the location of the asset. Claim 92 identifies the data signal received at the two receivers as an 802.11 communication sequence. Claim 106 requires multiple (claim 35) estimates of the data signal TOA at each receiver. Claim 111 requires calculating a TOA difference for each of at least two pairs of said estimates and determining the location of the asset using the pair of differences.

The cited references describe the general industry interest in using preexisting or known methods for asset location in the context of wireless networks. However, the elements of applicants' claims 35, 62, 84, 92, 106 and 111 are not shown, taught or suggested by the cited references, whether viewed individually or in combination.

For example, as correctly noted by the Examiner, Leblanc describes use of conventional TOA/TDOA techniques in a wireless infrastructure setting as a replacement for Global Positioning Systems technology. The conventional techniques involve synchronization of (hard wired) base station receivers and purposely introducing delays in signal paths. (See e.g. Leblanc, FIG. 11, pages 35-36). Leblanc describes measuring TOA at each "synchronized" base station/cell and computing the TDOA therefrom according to a specific TDOA model, which is unrelated to applicants' invention. (See e.g., Leblanc FIGS. 13 and 14). In particular, Leblanc does not show, teach or suggest the elements of claims 35, which as described in the first paragraph in this section

include: demodulating a received data signal, decoding the received signal to recover a time-stamp, and using a co-relation function to estimate a TOA when the decoded signal does not include a time stamp. Further, Leblanc fails to show teach or suggest the elements of claims 62, 84, 92, 106, and 111 (estimating TOA as in claim 35 at two receivers and calculating a TDOA (claim 62); using least two TDOA between three receivers (claim 84); requiring the data signal to be an 802.11 communication sequence (claim 92); making multiple TOA estimates at each receiver (claim 106); and using at least two pairs of TDOAs calculated from the multiple TOAs (claim 111)).

Li, as correctly noted by the Examiner, describes generalized and a known TDOA measuring method for overlaid geolocation systems that depends on delay measurement using a "high –precision timer instead of initial synchronization." (See e.g., Li col. 2). In particular, Li, in the context of 802.11 systems, describes using a round trip TOA that is determined by "differentiation of the transmitting time of a data frame and the receiving time of an ACK frame." (See e.g., Li page 3012). Li's method, like Leblanc's methods is unrelated to applicants' invention. Like Leblanc, Li also fails to show, teach or suggest the elements of applicants' claims 35, 62, 84, 92, 106, and 111 (which are described in the first paragraph of this section).

Hawkes, as correctly noted by the Examiner, describes a method for accurately measuring the time difference between two received signals that are " time delayed versions" of a transmitted signal. Hawkes' method relies on a master time standard or source (e.g., a GPS satellite or atomic clock) to time stamp or otherwise associate time with the transmitted signal. (See e.g., col. 9, lines 20-31 and col. 14 lines 11-43). Hawkes does not show, teach or suggest applicants invention, which according to claim

35 involves (1) demodulating the receiver signal, (2) decoding the received signal to recover a time-stamp, and (3) using a co-relation function to estimate a TOA when the decoded signal does not include a time stamp. Further, like Leblanc and Li, Hawkes also fails to show, teach or suggest the elements of applicants' claims 62, 84, 92, 106, and 111 (which are described in the first paragraph of this section).

Nakagawa, as correctly noted by the Examiner, describes a method for determining the location of mobile asset. In Nakagawa's method, the mobile asset is assigned a "intrinsic period.' The mobile asset periodically transmits a pseudo noise signal at time intervals corresponding to the assigned time intervals. The periodic signal transmission is received at various stations. The periodic signal received at one station is co-related with that received at another station to determine a TDOA. Nakagawa does not show, teach or suggest applicants invention, which according to claim 35 involves (1) demodulating the receiver signal, (2) decoding the received signal to recover a time-stamp, and (3) using a co-relation function to estimate a TOA when the decoded signal does not include a time stamp. Further, like Leblanc, Li, and Hawkes, Nakagawa, also fails to show, teach or suggest the elements of applicants' claims 62, 84, 92, 106, and 111 (which are described in the first paragraph of this section).

Lastly, Fattouche as correctly noted by the Examiner, describes a method for determining the location of mobile assets using TOA at several monitoring sites. Fattouche's method involves use of a time reference to synchronize the monitoring sites. (See e.g., Fattouche Abstract). TOA is obtained via correlation of the received signal at each monitoring site using a "super-resolution algorithm". Fattouche does not show, teach or suggest applicants invention, which according to claim 35 involves (1)

demodulating the receiver signal, (2) decoding the received signal to recover a time-stamp, and (3) using a co-relation function to estimate a TOA when the decoded signal does not include a time stamp. Further, like Leblanc, Li, Hawkes, and Nakagawa, Fattouche also fails to show, teach or suggest the elements of applicants' claims 62, 84, 92, 106, and 111 (which are described in the first paragraph of this section).

For at least the foregoing reasons, applicants' claims 35, 62, 84, 92, 106 and 111 are neither anticipated by nor obvious from the cited references -- Leblanc, Li, Hawkes, Nakagawa and Fattouche, whether viewed individually or in combination. Accordingly claims 35, 62, 84, 92, 106 and 111 are patentable over the cited references.

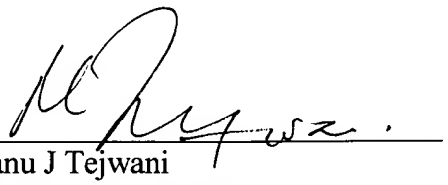
Dependent claims 36-61, 63-83, 85-91, 93-105, 107-110 and 112-118

Claims 36-61, 63-83, 85-91, 93-105, 107-110 and 112-117 are patentable over the cited references for at least the same reasons as their parent claims 35, 62, 84, 92, 106 and 111 are patentable as discussed above.

Conclusion

Applicants respectfully submit that this application is now in condition for allowance. Reconsideration and prompt allowance of which are respectfully requested. If there are any remaining issues to be resolved, applicants respectfully request that the Examiner kindly contact the undersigned attorney for early resolution.

Respectfully submitted,



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